

REMARKS**Status of the Claims**

Claims 1-9 are canceled without prejudice or disclaimer. Claims 25-36 are new and are supported throughout the as-filed application, for example, at paragraphs 40-47 and Examples 1-2. No new matter has been added. Accordingly, claims 10-36 are pending and claims 25-36 should be examined.

General Remarks

The Notice of Non-compliant Amendment mailed March 10, 2006, alleged that the claims filed in the Amendment of March 2, 2006 were presented in descending order. Because the claims were presented in ascending order, the Notice was withdrawn on March 23, 2006. Applicants respectfully request an indication of record that negative patent term will not accrue.

The Notice of Non-compliant Amendment mailed May 17, 2006, alleged that "Applicant did not address both the 112, 1st paragraph rejections." Examiner Kubelik is acknowledged for pointing out this inadvertent omission, which is presently addressed.

Drawings

Applicants respectfully request approval of formal drawings 4A-D and an indication thereof in the next PTO communication.

Application Data Sheet

Applicants have submitted a Supplemental ADS to correct the priority claim. Office Action, item 3, page 2. The Supplemental ADS also reflects the inventors' updated addresses.

Claim Objections

Claims 1-9 are objected for minor informalities. See Office Action, items 4-5, pages 2 and 3. Because claims 1-9 are canceled, these issues are moot.

Rejections- 35 U.S.C. § 112, First Paragraph (Enablement)

Claims 1-7 are rejected for alleged lack of written description. Office Action, items 6-7, pages 3-4. Briefly, the PTO takes the position that claims 1-7 embrace a method for mapping in any *Gramineae*, and yet the specification allegedly only provides discussion of mapping RFLP markers in *Tripsacum* and maize and transposon tagging. Additionally, the PTO alleges “there is no evidence that the *elongate* mutant is apomictic.” Office Action, paragraph bridging pages 3-4. Applicants respectfully traverse the grounds for this rejection.

While claims 1-7 have been canceled without prejudice or disclaimer, the as-filed specification provides enabling support for a method for identifying a *Gramineae* nucleotide sequence orthologous to a sequence conferring apomictic development. From this perspective, the specification provides several methods for identifying such a *Gramineae* nucleotide sequence. For example, a *Gramineae* sequence may be identified in *Tripsacum* and maize by RFLP mapping. In fact, the PTO even admits that the instant specification discloses mapping with publicly available RFLP markers in at least two species, *Tripsacum* and maize. Office Action, page 3, item 7.

It seems that the PTO expresses concern about the number of plant species tested. However, U.S. case law makes it clear that as long as the specification discloses at least one method for making or using the claimed invention, then the claimed invention satisfies Section 112 enablement requirements. *Spectra-Physics, Inc. v. Coherent, Inc.*, 827 F.2d 1524, 1533, 3 USPQ2d 1737, 1743 (Fed. Cir.), cert. denied, 484 U.S. 954 (1987). Because the specification provides an enabling disclosure for *Tripsacum* and maize, applicant need not disclose every plant species in which the claimed invention finds applicability.

The PTO’s assertion “there is no evidence that the *elongate* mutant is apomictic” is unfounded. Office Action, paragraph bridging pages 3-4. As indicated in the specification at paragraph 0108, *elongate* (*ell*) has long been recognized as a recessive meiosis mutation. That is, plants homozygous for *ell* have decondensed chromosomes during metaphase and anaphase, causing various abnormalities. Notably, *ell* plants produce a significant portion of non-reduced gametophytes, which is a hallmark of apomixis. Moreover, and as described in Example 2, *ell* mutants have phenotypic characteristics indicative of a apomixis. For example,

the present inventors observed that *Tripsacum* and maize homozygous recessive *ell* plants (i.e. *ell/ell*) display a fine cellular wall, direct development of the parent cell of the megasporangium in the embryo sac, and absence of callose depots in the parent cell. Therefore, the as-filed specification describes *ell* mutants having an apomictic phenotype.

Moreover, Spillane, C., *et al.*, *Sex Plant Reprod* 14:179-187 (2001) (see Exhibit A) discloses that most, if not all, apomicts are facultative, where both apomictic and sexual reproduction occur in the same plant. See page 180, right column. Notably, Spillane *et al.* indicate that *ell* displays apomixis characteristics. *Id.* at Table 1.

Accordingly, and as reflected in new claims 25-36, the specification enables the skilled artisan to identify a locus that co-segregates with an apomictic phenotype, clone the corresponding polynucleotide segment, and verify that the segment confers apomictic development by creating and analyzing a loss-of-function mutation.

Rejections- 35 U.S.C. § 112, First Paragraph (Written Description)

Claims 1-7 are rejected under 35 U.S.C. § 112, first paragraph, for alleged lack of written description. Office Action, item 8, page 4. The PTO alleges “Applicant does not describe any nucleic acids encompassed by the claims, and the structural and functional features that distinguish all such nucleic acids from other nucleic acids are not provided.” That is, the PTO is understood to take the position “Because the sequences are not described, the method of using the sequences to map mutations “orthologous to genes involved in apomixis” is likewise not described, and the specification fails to provide an adequate written description of the claimed invention.” Applicants respectfully traverse the grounds for this rejection.

The as-filed application provides written support for nucleotide segments conferring, for example, an apomictic phenotype and methods for producing same in a plant species. For example, the application discloses molecular markers from maize and *Tripsacum* that can be used for identifying orthologous sequences in another plant species that confer apomictic development. Illustrative molecular markers include umc28, csu 68, and umc 62, as disclosed in paragraph 28 of the as-filed specification. Additionally, the as-filed application provides detailed written support for a method for using these molecular markers to identifying nucleic acid sequences conferring apomictic development. For example, the specification at

paragraphs 40-47 and Example 2 discloses a method for identifying a maize nucleotide sequence orthologous to a *Tripsacum* nucleotide sequence.

Contrary to the PTO's position, applicants need not provide structural and functional features that distinguish all such nucleic acids from other nucleic acids. That it, for the purposes of satisfying the written description requirement, it is sufficient that the application provides written support for a means for identifying a nucleotide segment conferring apomictic development by using, for example, the illustrative molecular markers, to select orthologous sequences in a plant species and then verify that the orthologous sequence confers apomictic development by creating and analyzing a loss-of-function mutation in the plant species. Accordingly, the rejection is improper and should be withdrawn.

Rejections- 35 U.S.C. § 112, Second Paragraph

Claims 1-7 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite. Office Action, items 9-10, pages 4-6. Because claims 1-7 have been canceled without prejudice or disclaimer, these issues are moot.

Rejections- 35 U.S.C. § 102(b)

A. Rejections in view of Leblanc *et al.*

Claims 1-5 are rejected under 35 U.S.C. § 102 (b) as allegedly anticipated by Leblanc *et al.* The PTO alleges "Leblanc *et al.* used RFLPs to map mutations responsible for diplosropy in an apomictic form in a maize-Tripsacum hybrid." Office Action, item 12, page 6. Applicants respectfully traverse the grounds for this rejection.

A reference anticipates a claim only if that reference describes each and every element of the claim. MPEP § 2131. If even just one element is absent from the reference's particular disclosure, that disclosure neither describes nor anticipates the claim. *Id.* Such is the case here.

According to the evidence and explanation of record, Leblanc *et al.* does not describe a method for identifying and cloning a sequence conferring an apomictic phenotype by creating and analyzing a loss-of-function mutation. Because Leblanc *et al.* does not anticipate each element of the claimed invention, the rejection is improper and should be withdrawn.

B. Rejections in view of Kindiger *et al.*

Claims 1-4 are rejected under 35 U.S.C. § 102 (b) as allegedly anticipated by Kindiger *et al.* The PTO alleges "Kindiger *et al.* used RFLPs and RAPDs to map mutations responsible for diplospory in an apomictic form in maize-Tripsacum hybrids." Office Action, item 13, page 6. Applicants respectfully traverse the grounds for this rejection.

According to the evidence and explanation of record, Kindiger *et al.* does not describe a method for identifying and cloning a sequence conferring an apomictic phenotype by creating and analyzing a loss-of-function mutation. Because Kindiger *et al.* does not anticipate each element of the claimed invention, the rejection is improper and should be withdrawn.

C. Rejections in view of Pessino *et al.*

Claims 1-3 are rejected under 35 U.S.C. § 102 (a) as allegedly anticipated by Pessino *et al.*, *Hereditas* 128:153-158 (May 1998). Office Action, page 7, item 14.

Applicants respectfully traverse the grounds for this rejection the present application claims priority to February 17, 1998, whereas the cited article was not accepted for publication until February 21, 1998 and did not publish until May 1998. Accordingly, the rejection is improper and should be withdrawn.

D. Rejections in view of Grimanelli *et al.*

Claims 1-5 are rejected under 35 U.S.C. § 102 (a) as allegedly anticipated by Grimanelli *et al.*, *Heredity* 80:33-39 (January 1998). The PTO alleges Office Action, page 7, item 15. The PTO alleges "Grimanelli *et al.* used RFLPs, including umc28, csu68, and umc62, to map mutations responsible for diplospory in tetraploid Tripsacum." Office Action, item 15, page 7. Applicants respectfully traverse the grounds for this rejection.

According to the evidence and explanation of record, Grimanelli *et al.* does not describe a method for identifying and cloning a sequence conferring an apomictic phenotype by creating and analyzing a loss-of-function mutation. Because Grimanelli *et al.* does not anticipate each element of the claimed invention, the rejection is improper and should be withdrawn.

E. Rejections in view of Pessino *et al.*

Claims 1-3 are rejected under 35 U.S.C. § 102 (a) as allegedly anticipated by Pessino *et al.*, *Theor. Appl. Genet.* 94:439-44 (1997). The examiner alleges "Pessino *et al.* used RAPDS

and RFLPs to map mutations responsible for apospory in hybrid Brachiaria." Office Action, page 7, item 16. Applicants respectfully traverse the grounds for this rejection.

According to the evidence and explanation of record, Pessino *et al.* does not describe a method for identifying and cloning a sequence conferring an apomictic phenotype by creating and analyzing a loss-of-function mutation. Because Pessino *et al.* does not anticipate each element of the claimed invention, the rejection is improper and should be withdrawn.

F. Rejections in view of Hanna *et al.*

Claims 1-3 are rejected under 35 U.S.C. § 102 (e) as allegedly anticipated by Hanna *et al.* The PTO alleges "Hanna *et al.* used RAPDs, RFLPs, and STS markers to map mutations responsible for apospory in hybrid Pennisetum." Office Action, page 7, item 17.

According to the evidence and explanation of record, Hanna *et al.* does not describe a method for identifying and cloning a sequence conferring an apomictic phenotype by creating and analyzing a loss-of-function mutation. Because Hanna *et al.* does not anticipate each element of the claimed invention, the rejection is improper and should be withdrawn.

G. Rejections in view of Kindiger *et al.*

Claims 1-6 are rejected under 35 U.S.C. § 102 (e) as allegedly anticipated by Kindiger *et al.* The PTO alleges "Kindiger *et al.* used RFLPs, including csu68, and RAPDs to map mutations responsible for diplospory in an apomictic form in maize-Tripsacum hybrids." Office Action, page 8, item 18. Applicants respectfully traverse the grounds for this rejection.

According to the evidence and explanation of record, Kindiger *et al.* does not describe a method for identifying and cloning a sequence conferring an apomictic phenotype by creating and analyzing a loss-of-function mutation. Because Kindiger *et al.* does not anticipate each element of the claimed invention, the rejection is improper and should be withdrawn.

Rejections- 35 U.S.C. § 103(a)

Claims 1-7 are rejected under 35 U.S.C. § 103 (a) as allegedly obvious over Kindiger *et al.* While the PTO admits that Kindiger *et al.* does not disclose transposon tagging the mutation linked to csu68, the PTO alleges that it would have been obvious to transposon tag the mutation based on Kindiger's suggestion to tag genes. Office Action, pages 8-9, items 19-20.

Even if it were obvious to transposon tag a gene, such as csu68, Kindiger *et al.* still would not render the present invention obvious. That is, to establish a *prima facie* obviousness

of a claimed invention, all the claim limitations must be taught or suggested by the prior art. MPEP § 2143.03. Because Kindiger *et al.* neither teaches nor suggests identifying and cloning a sequence conferring an apomictic phenotype by creating and analyzing a loss-of-function mutation, Kindiger *et al.* would not render the present invention obvious. Accordingly, the rejection is improper and should be withdrawn.

CONCLUSION

If there are any questions concerning this application, the examiner is invited to contact the undersigned counsel.

Respectfully submitted,

By  35,087
for

Date July 19, 2006 (Monday)

FOLEY & LARDNER LLP
CUSTOMER NUMBER 22428
Telephone: (202) 672-5300
Facsimile: (202) 672-5399

Stephen A. Bent
Attorney for Applicants
Registration No. 29,768

Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account No. 19-0741 for any such fees; and applicants hereby petition for any needed extension of time.